Intermodal Solutions
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Presentation Outline

- Purpose / Objective
- Background
- Current Issues
- Research
- Proposed Solutions
- Challenges Faced By the Team
- Acknowledgements
Purpose and Objective

• Improve the truck flow in and around an intermodal facility at Harvey, IL which is owned by Canadian National (CN).

• Create physical designs that utilized the network of highways surrounding the intermodal yard.
Project Site

- Located in Harvey, IL
- Near Interstates 57, 80, & 294
- Sponsor Mi-Jack Products Inc
- Mi-Jack creates products that increase efficiency of intermodal yard shipping containers

Current Entrance at 159th
Intermodal Yards

• The meeting point of trains and trucks

• Intermodal freight is the fastest growing segment of US freight industry.

• Most utilized way to transport shipments.

• Chicago area has 27 intermodal yards with 700 miles of loading and unloading tracks.
The Issues

- Cause influx of truck traffic into surrounding area
- Intermodal freight is expected to double in 10 years
- Need to optimize performance with low cost and positive environmental benefits.
Team Organization

Community Impact
- Researched large-scale impact project will have on surrounding region
- Presented understanding of zoning laws and environmental impact on community

Yard Design
- Designed options for increasing accessibility to intermodal yard
- Created 3D walkthrough of project

CN’s Acquisition of the EJ&E

- Chicago is the world’s 3rd busiest intermodal hub, surpassed only by Hong Kong and Singapore.

- Takes a freight train longer to go from the North to the South side of Chicago (30 mi.) than it does to go from Chicago to Winnipeg, Canada (860 mi.).

- Rail lines will reduce congestion in the Chicago-area rail network.
Frontage Roads

- Primarily used in Texas, sparse examples in Illinois
- Access road running parallel freeway, feeding into freeway at interchanges
- Increase efficiency of accessing
- Shown to greatly increase development of an area
Environmental Impact

- Noise Regulations

<table>
<thead>
<tr>
<th>Category</th>
<th>Max noise level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>67 dBa</td>
<td>Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.</td>
</tr>
<tr>
<td>C</td>
<td>72 dBa</td>
<td>Developed lands, properties, or activities not included in Categories A or B above.</td>
</tr>
</tbody>
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- Land use regulations (Zoning)
Noise Level Analysis

- Noise levels were estimated using a simulation from the Federal Highway Administration.
- 159th St. and I-80 highway evaluated as they would be the most affected by the designs.
- Projected traffic values were used as data in the simulation.
Zoning

- Created to illustrate and analyze the different land use around the rail yard
- Yellow - single family residential
- Orange - multi family residential
- Red - indicates commercial
- Purple - industrial
- Green - parks and open spaces
Ethics

- Environmental Impact was a great concern
- Apparent Violations of Noise Requirements
- Residential buildings in an industrial zoned area
Proposed Solution 1

Option 1 - Two One Way Frontage Roads

- This option requires two frontage roads, one on each side of I-80. It would require a bridge that goes over I-80 to allow east-bound trucks to enter and leave the yard.
Proposed Solution 2

Option 2 - Frontage Road Utilizing Center Ave

- This option is to use the empty space on the north and south sides of I-80 just past the intermodal yard to put a set of exits and entrances onto Center Avenue.
Proposed Solution 3

Option 3 - Convert 171st Into a Two Way Frontage Road

- This option requires converting 171st into a two way frontage road using the existing ramps at Halsted Street.
Proposed Solution 4

Option 4 - Ramp Directly Into Yard

- This option is similar to option 1 but has no frontage roads. Unlike option 1 this option only requires space for the on/off ramps and the piers that go along with it.
3D Design Option 1
Current And Projected Traffic

- Darker Lines: more traffic
- Black Numbers: total traffic
- Red Numbers: effect of ramp
- Green Numbers: change in traffic
- Blue Numbers: percentage change in traffic
Challenges Faced

- Software Learning Curves
  - AutoCAD intensive project

- GIS

- Work was in parallel rather than sequentially
  - Research conducted simultaneously

- Working on ramp design and yard layout parallel to generating a walkthrough
Acknowledgements

- Sponsor Mi-Jack Products, Inc
- Professor Rohter
- Peter Mirabella
- Professor Novak